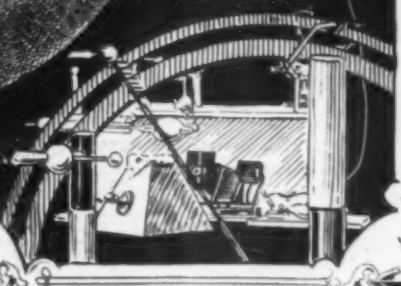
LIBRARY OF CONGRESS
82775
MAR 26 1898
SMITHSONIAN DEPOSIT

VOL. 2. No. 3. MARCH, 1898.

THE AMERICAN X-RAY JOURNAL

A MONTHLY DEVOTED TO THE PRACTICAL APPLICATION OF THE NEW SCIENCE AND TO THE PHYSICAL IMPROVEMENT OF MAN.



AMERICAN X-RAY PUBLISHING CO.
INSURANCE EXCHANGE BLD'G.
BROADWAY & OLIVE ST.
ST. LOUIS.

"WELL PREPARED!! NUTRITIOUS!! EASILY DIGESTED!!"

HIGHEST AWARDS WHEREVER EXHIBITED

THE WORLD'S COLUMBIAN COMMISSION.

IMPERIAL GRANUM

THIS STANDARD PREPARED

FOOD

IS EARNESTLY RECOMMENDED as a most reliable FOOD for INFANTS, CHILDREN and Nursing-Mothers; — for INVALIDS and Convalescents; — for Delicate and Aged persons. It is not a stimulant nor a chemical preparation; but a PURE, unsweetened FOOD carefully prepared from the finest growths of wheat, ON WHICH PHYSICIANS CAN DEPEND in FEVERS and in all gastric and enteric diseases. It is easily digested, nourishing and strengthening, assists nature, never interferes with the action of the medicines prescribed, and IS OFTEN THE ONLY FOOD THE STOMACH CAN RETAIN.

★

IT SEEMS TO HOLD FIRST PLACE IN THE ESTIMATION OF MEDICAL OBSERVERS.—*"The Feeding of Infants," in the New York Medical Record.*

CONTAINS NO TRACE OF ANY IMPURITY.—*The Lancet, London, England.*

A valuable aid in all the graver forms of gastric and enteric diseases.—*The Prescription.*

As a food for patients recovering from shock attending surgical operations IMPERIAL GRANUM stands pre-eminent.—*The International Journal of Surgery, New York.*

Not only palatable, but very easily assimilated.—*The Trained Nurse, New York.*

IMPERIAL GRANUM is acceptable to the palate and also to the most delicate stomach at all periods of life.—*Annual of the Universal Medical Sciences, Philadelphia, Penna.*

Highly endorsed by the best medical authorities.—*North American Practitioner, Chicago.*

It has acquired a high reputation, and is adapted to children as well as adults—in fact, we have used it successfully with children from birth.—*The Post Graduate Journal.*

Especially valuable in fevers, and often the only food the stomach will tolerate in gastric and enteric diseases.—*Dominion Medical Monthly, Toronto.*

It has stood the test of years, while many competing foods have come and gone, and have been missed by few or none. But it will have satisfactory results in nutrition far into the future because it is based on merit and proven success in the past.—*The Pharmaceutical Record, N. Y.*

IMPERIAL GRANUM is a thoroughly reliable product.—*The Medical Century, Chicago.*

We have used it with the best possible results in several cases of summer diarrhoeas in children. —*The Western Medical Journal, Fort Scott, Kansas.*

It has steadily won its way, step by step, until it now stands unchallenged at the head of all food preparations.—*The Medical Council, Philadelphia, Pa.*

Most valuable for patients recovering from acute diseases.—*The Medical Progress.*

Serviceable in fevers and in all forms of gastric disturbances.—*The Medical Herald, St. Joseph, Mo.*

IMPERIAL GRANUM—that sterling FOOD!—*The Medical Fortnightly, St. Louis, Mo.*

★ Physician's samples sent free, express-paid, to any physician—or as he may direct. ★

JOHN CARLE & SONS, Wholesale Druggists, 153 Water Street, NEW YORK CITY, N. Y.

THE AMERICAN
X-RAY JOURNAL.

Devoted to Practical X-Ray Work and Allied Arts and Sciences.

VOL. 2. *ST. LOUIS, MARCH, 1898.* *NO. 3.*

THE AMERICAN X-RAY JOURNAL.

PUBLISHED MONTHLY BY

THE AMERICAN X-RAY PUBLISHING CO.

INSURANCE EXCHANGE BUILDING,

BROADWAY AND OLIVE STREET, ST. LOUIS.

HEBER ROBARTS, M.D., EDITOR.

C. C. SPINK, BUSINESS MANAGER.

New York City Business Office, 114 Nassau St., Room 502. T. L. BROPHY, Representative.

Chicago Business Office, 87-89 Washington St., Room 513. FRED W. SPINK, Representative.

SUBSCRIPTION RATES—IN ADVANCE.

United States, Canada and Mexico	$1 00
Single copies	15
Foreign Countries	2 00
Single copies	20

ADVERTISING RATES.

One Page, one year	$200 00
Half Page, one year	110 00
Quarter Page, one year	60 00

Address all communications to

THE AMERICAN X-RAY PUBLISHING CO., ST. LOUIS.

Entered at the postoffice at St. Louis, Mo., as second-class matter.

THE electric current will be diminished if the carbon in the electric cell is touched with paraffine or wax.

CERTAIN substances may be caused to pass through the skin in the direction of the positive to the negative or negative, to the positive pole, but the medicament in each case is mostly limited to one direction.

THE green serpentine movement seen within a Crooke's tube when charged with a coil machine indicates either that the tube is worn out or the voltage is too low, if with an influence machine it indicates wrong connection to the tube.

SOME of the best operators with x-ray machines have never had any previous experience with electrical apparatus. The genius of man is often best developed when he is made self-reliant. The race is not always to the swift, nor the battle to the strong.

WIRES paraffined will prevent "crosses" and "short circuits" when they run in numbers. Single wires may be sufficiently insulated with cotton, silk or mackite. All textile material is hygroscopic and are therefore poor insulators when the wires are bunched.

THE subject of the first lesson for every prospective electro-therapeutist should be patience. The lesson should be memorized and worshiped with the zeal of the Mohammedans worshiping Allah. The x-ray student must "learn to labor and to wait." The reward in either case is bountiful.

COMMERCIAL formol is the best preservative of tissue. A 10 per cent solution will preserve the color of the brain and the smaller vessels will after months still have red color of the hemaglobin. 60 per cent of ethyl alcohol and 10 per cent of formol will harden nerve tissue and preserve the normal dimensions.

OUR published offer in the February issue to give to each of the first two persons who would point out misspelled words in THE AMERICAN X-RAY JOURNAL, one years' subscription, was answered

by five persons on the third day after the JOURNAL had gone into the mails. They were the first and since they all came in the same delivery we have concluded to give credit to each and therefore the one years' subscription goes to the following:

Dr. John Pitkin, Sr., Buffalo, N. Y.; W. H. Van Sickel, Electric Engineer, Eau Claire, Wis.; Dr. Fred. H. Holcom, Buffalo, N. Y.; N. L. Pence, M. S., Professor Physics, Lexington, Ky. and W. W. Judd, M. D., 93 Flournoy Street, Chicago.

Prof. Van Sickel pointed out the greatest number of errors which are as follows:

Page	163	second	col.	third	line "elictricity"
"	166	first	"	35	" "dermatatis"
"	189	second	"	32	" "gainst"
"	190	first	"	14	" "dispair"
"	192	"	"	38	" "radigraphy"
"	193	"	"	18	" "indispensible"
"	178	"	"	8	" "decreptitude"
"	iii	"	"	22	" "gynescologist"

The same offer is to continue until and including the June issue.

THE use of the electric street current in the treatment of disease has been recently adversely criticised. It is claimed that during treatment the patient is in constant danger from a sudden overflow of electricity. Under usual conditions the variation of voltage is but slight, but there is danger of leading-in wires crossing of higher voltage which would greatly increase the pressure. This could occur also from an accident which might happen in the engine room that would greatly increase the speed of the generator. It is also said that before the current could be cut off it would pass through the protecting devices and through the body. We have no authenticated account of an accident occurring from any such cause.

In using the dynamo current in coils for x-ray work the tubes are known to be exceedingly sensitive to the varying demands made from time to time upon the street current. A change of two or three volts in the street current instantly affects the x-radiance to an appreciable extent.

IF three parts of sifted and calcified oyster shells are mixed with one part of flour of sulphur and exposed to high heat for one hour the result is one of the phosphori. Exposure of this powder in a glass tube to burning magnesium will cause it to shine and emit different colored rays of light in the dark. This curious effect is called phosphorescence. If the tubes containing the powder are exposed to the sun-rays the effect is the same and the resulting phenomena are called phosphorescence after insolation. Many other substances are made to produce the same curious effect. It is found that almost all bodies which acquire phosphorescence by exposure to the sun or by heat, become luminous by friction. Mechanical force can only be regarded as an indirect mode of producing light, because heat is first developed; heat is a source of light, and *vice versa*.

It is the phosphoregenic rays or those which have the power of continuing chemical changes that render certain bodies phosphorescent by insolation and these rays extend from the indigo to beyond the violet.

If the original rays of certain substances undergo a change in their refrangibility that substance may become self-luminous. The electric lamp casting its bright rays through blue glass and then falling upon a plate of glass colored yellow by the oxide of uranium will cause the latter to become self-luminous. This is internal dispersion of the rays and is titled by Professor Stokes fluorescence. A strong solution of sulphate of quinine with tartaric acid spread over a surface will become self-luminous and fluoresce when rays passed through violet glass are allowed to fall upon them.

Long before Professor Roentgen had

identified the x-rays it was known that "a tube of uranium glass, conveying the coil discharge *in vacuo*, is similarly, with fluorescence, affected by this peculiar electric light."

THE *Electrical Engineer* editorially warns the government of a serious omission in the equipment of our war ships. There is no adequate means for ascertaining the temperature of the magazines or coal bunkers at sufficiently short intervals. While merchant marine vessels are adequately protected by thermostats as a safeguard against fire, the war ships lack this necessary precaution.

This is certainly timely warning, but of much less importance than that which should be given against the appointment to office of stubborn and eccentric characters. Eccentricity is the bordering line to insanity, the affected person's mind running in deep channels with a deaf ear to all but his own opinions. If the navy authorities had heeded the admonition of the commanding officer of the Maine no explosion would have occurred.

ELECTRIC POWER PLANT, HELENA, MONTANA.

Below Canyon Ferry in the upper Missouri, seventeen miles north of Helena, Mont., the river was recently dry for forty-eight hours because of a dam that had been completed by the electric power Co., of Helena. It required two days for the river to fill the great lake made by the dam. The surface of the lake has an area of six square miles. Before the water flowed over the dam prospectors were washing for gold and large catches of trout, stone rollers and other fish were taken out of the pools formed in the bed of the river.

The dam is 35 feet high and was built at a cost of $450,000. It is to furnish electric power for Helena. The city has some 20,000 inhabitants and boasts of the possession of more wealth per capita than any other city in the world. Forty millions of dollars was washed from the sands within the city limits. It was here that the Parent Shrine was banqueted in its pilgrimage across the continent from New York to San Francisco.

It is said that every person in the town above eight years of age can read and write, including the Chinese.

The city is beautifully located at the foot of Mount Helena, overlooking an extensive fertile plain to the east and to the north more than fifteen miles. Here the tortuous Missouri wends her way, upon whose farther shores rise precipitously a range of lofty mountain peaks.

COAL DISCOVERY.

The South African Journal, *Machinery*, reports a find of coal, sixteen miles from Johannesburg which measures 217 feet in thickness and forms the thickest seam in the world. It is 150 feet thicker than the Mammoth seam, which is also located in South Africa. This seam of coal lies in a basin limited to about 1,200 acres. The first indication of coal was met by a native while sinking a well. Several years after Mr. J. B. Garbe, of Johannesburg, advised the owners to bore. Coal was first struck at 304 feet, after passing through about 200 feet of clay and shales and 104 feet of sandstone. The thickness of the first seam is 18 inches. Further passing through 9 feet of sand stone the main body of coal was struck at 313 feet.

THE statement made some time ago by Dr. Estes that "nowadays a surgeon will rarely be satisfied that a bone is properly set until verified by the x-rays" is supplemented by the fact that "the day has passed when arbitrary illustrations on the surgery of bones and joints will be appreciated without radiographs to prove the case."

A FEW ILLUSTRATING CONTRIBUTIONS TO THE SIGNIFICANCE OF FRACTURES AND DISLOCATIONS.

BY CARL BECK, M. D.,
Professor of Surgery, New York School of Clinical Medicine, Surgeon to the St. Mark's Hospital, etc.

Since the Roentgen rays began their triumphal, revolutionizing march through the world, our knowledge of fractures and dislocations, has been greatly widened. In trying to comply with the kind request of the editor of this Journal, to prepare an article on an x-ray subject, I do not intend to enter into a general discussion on this most interesting and delightful topic, but I just beg to submit a few illustrations of fractures and dislocations of various regions of the body, which may speak louder than any well prepared treatise.

The reader particularly interested in the study of the Roentgen rays in general is referred to my former publications in the January and June issues of the *International Medical Magazine.*

Fig. 1 represents a slight thickening of the joint-surface of the first phalanx of the left thumb in the metacarpo-phalangeal joint and an extensive exostosis of the second phalanx of the second right finger in a boy, twelve-years of age. The swelling around the joint was thought to be of a tubercular character first, as the boy showed a tubercular habitus, swollen glands in the neck, rhachitic thorax, etc.

Fig. 2 shows the dislocation of the second phalanx of the right thumb in the phalangeal joint of a woman 32 years of age. The accident happened four years ago. The function of the joint is greatly impaired.

Fig. 3 shows compound fractures of the second phalanx of the fourth and of the second and third phalanges of the fifth finger.

Fig. 4 shows a fracture of the ulna, sustained two days before the radiograph was taken, in a child two years of age. The fragments are overlapping.

Fig. 5 represents a compound multiple fracture of the elbow in a man 40 years of age, whose elbow was crushed in a machine three months before the skiagram was taken. An operation, consisting in the removal of fifteen bone-splinters, representing fragments from both condyles and the olecranon, was performed one week after the accident had happened. The large cavity was packed with iodoform gauze. Recovery was nearly perfect, the functions of the arm being but little impaired. Now the patient is even able to do heavy work in his trade as a butcher. The skiagram shows the irregular attachment of the different fragments.

Fig. 6 shows a fracture of the middle of the right humerus in a boy 10 years of age. The skiagram was taken two months after the accident. There is slight deformity. The extensive callus-formation impaired the function of the arm, particularly of the biceps muscle. The adhesions which had formed between the muscle and the callus yielded to massage treatment.

Fig. 7 shows a fracture of the anatomical neck of the right humerus in a girl six years of age. Dislocation of the humerus was first thought of by various physicians of excellent repute, until the rays revealed the true nature of the injury. The skiagram was taken two weeks after the accident.

Fig. 8 shows a compound fracture of the lower third of the tibia and of the external malleolus, caused by the new United States (Krag-Jorgensen) army bullet, shot from a distance of about 200 yards. The picture shows, that the bullet does not cause, as it is generally erroneously assumed, a clean, round, canal-like foramen, but that it destroys organic tissue, particularly bone, most extensively, at least in a zone of 400 yards.

(Cut produced in Oct. issue of THE AMERICAN X-RAY JOURNAL.)

FIG. 1.

FIG. 2.

FIG. 3.

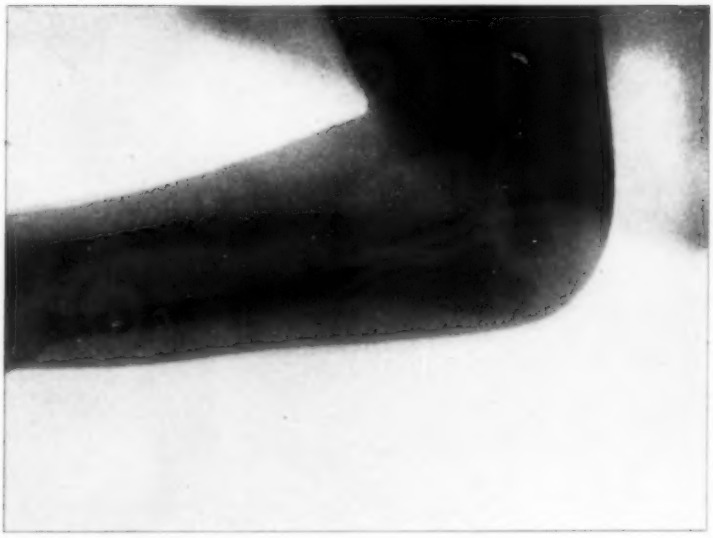


FIG. 4.

FIG. 5.

FIG 6.

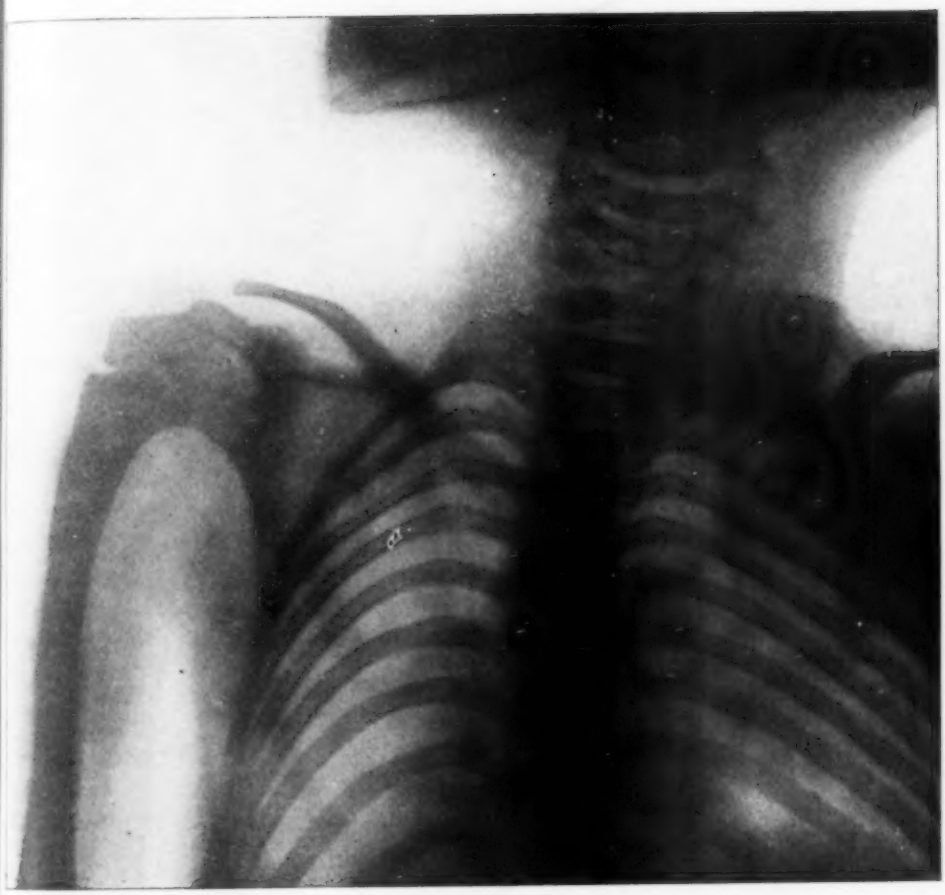


FIG. 6.

FIG. 9.

FIG. 10.

Fig. 9 represents a case of Pott's fracture, sustained 18 months ago, where only slight thickening of the internal malleolus can be noted on external examination. The patient complains of intense pain in the fractured area, the cause of which was thought to be callus-formation in the inter-osseous space. But the rays showed that the seat of the pain could only be within the soft tissues, as the conditions of the bone were entirely normal. Later the diagnosis neuritis was made by an eminent neurologist.

Fig. 10 represents an oblique supra-malleolar fracture of the tibia in a lady, 68 years of age. No immobilization had been tried in this case for a whole week, so that the displacement could not be reduced entirely. The skiagram was taken two months after the accident.

High E. M. F. Trowbridge. *Sc. Am.*, Jan. 15. *The Electrical World.*—A short article describing his high voltage battery and experiments; a short article referring to these was noticed in the *Digest*, Jan. 15. He believes this to be the largest plant for the study of discharges of electricity that exists at present; it consists of 10,000 storage batteries, of which an illustration is given; it is combined with a Plante rheostatic machine, by means of which he obtains over 1,000,000 volts, producing a spark in air more than four feet in length. Each cell is composed of a test tube 5.5 inches long and 0.75 inch internal diameter, containing two strips of lead separated from each other by rubber bands, and immersed in sulphuric acid; each has an internal resistance of 0.25 ohm; they are mounted in sets of three in blocks of wood which have been carefully paraffined; the battery gives 8 amperes (!) at 20,000 volts. He found that x-rays require at least 100,000 volts. With the rheostatic machine, condensers are charged in parallel and discharged in series; there are sixty condensers made of plates of glass 15" x 18", coated on both sides with tin-foil, and with 20,000 volts he can therefore obtain 1,200,000; this machine, which is illustrated, is operated by lever arms instead of the usual cylindrical commutator. Besides the results already noticed in the previous article, he states that he has shown conclusively that the length of the spark between points separated by more than 1 inch varies directly with the E. M. F.; a spark 48 to 50 inches long requires 1,200,000 volts, and a lightning discharge one mile long would therefore require over 100,000,000 volts. Burns like those produced by x-rays will be obtained if the hand is exposed to the brush discharge from the terminals of this machine. He shows that there is no use insulating lightning rods: also that no vacuum tube which he could produce could resist the discharges due to this voltage.

Roentgen Rays and Gold Quartz.—Tesla believes that mountains can be radiographed by the x-rays, and gold located without the trouble of excavation; that such mining is possible at Klondyke, though as yet only to a limited extent. He says that some Roentgen rays "are without limit as to length and radiography. They are limited now because of our almost toy apparatus for producing them. He thinks that as it is only a question of tubes and currents, at any moment a way may be found for producing rays that will penetrate hills and mountains, perhaps the earth itself. A noted metallurgist has a radiograph of quartz with gold imbedded in the center and concealed from the naked eye. He believes that much labor can be saved and a great deal more gold mined at Klondyke if the beds and mounds of sand and gravel are searched by x-rays as they are thrown up. Then only the highest dirt need be washed.—*Med. and Scientific News.*

ROENTGENOGRAM ETHICS.

Radiographer to the Methodist Episcopal Hospital; Member of the Kings' County Medical Society, the Brooklyn Pathological Society, the Long Island College Hospital, and Kings' County Hospital Alumni Association, of Brooklyn, N. Y.

BY FREDERICK STRANGE KOLLE, M. D.,

Now, that most experimental research among radiographers, has been laid aside, the most important questions arise, as to how these invisible rays of Roentgen, are to be applied, by whom, and for whom? I refer to cases of a surgical or anatomical nature only. In answer to the first question, it would hardly be necessary to dilate at length upon a description of the methods used by the various specialists; by all means care, judgment and practical knowledge are to be employed.

There is no danger in these cathode emanations—that is, as far as we now know. The early cases of dermatitis and alopecia Roentgenosa, resulting from exposure, have been satisfactorily proven, to be either, due to carelessness, poor judgment, or an insufficient knowledge of the apparatus used! There is no need for such results and I believe later statistics show a very marked decrease in the number of cases of injury reported.

The question as to who should be permitted to make a radiogram is a very important one. The fact, that so much nonsense as to the dangerous results following the application of the x-rays, has been infused into the minds of the general surgical fraternity, is principally due to the fact, that, men, professional and otherwise, have jumped at the conclusion that either they were electrical experts or cut out for expert witnesses in damage suits! Humanity and suffering seems to have been entirely overlooked by many x-ray operators! They seem to be in the specialty, for what financial benefit and fame they can derive from the mysterious work.

For the past eight months, practitioners and even surgeons of repute have asked me, how could I account for the dullness of x-ray work? Why was it not used in every hospital—as it should be? Why has it dwindled down so suddenly?

I will gladly answer for the hundredth time, that, the stagnation of radiography, etc., is not due to its loss in value, but to the fact that so many inexperienced men are and have used the rays both privately and in hospitals; that, more of these self-dubbed physicists, are handling delicate apparatuses that require a most expert knowledge and that, owing to these facts, hospitals and private individuals have laid aside the affair, as exceedingly expensive—even dissatisfactory! For no other reasons? In the first place, a vacuum tube needs to be thoroughly understood before even an electrician can use it. Invariably a tube is pierced the first or second time it is used, or it is otherwise misused, so that it is ruined. Tubes are expensive—they should be, and the result is, the operator becomes disgusted, says it does not pay him to continue the work. The hospitals can not allow a requisition for new tubes every week; consequently, the entire usefulness and value of the rays, is entirely overlooked and allowed to rest in statu quo, or sink into a rustful abyss of dear oblivion!

This goes to show, that, either an operator must be an electrician, a physicist or, have studied the uses and application of this new art from beginning to end. One or two hours instructions are not to be considered at all! It requires weeks to understand the apparatus alone, and even months to learn how to use it properly and with success! Experience alone, is the educator and that must be obtained, before a man launches himself into the specialty. Do we expect physicists, electricians and experimenters to do all for you; you have their results in plain facts; they

are obtained by deep and careful study; every new idea represents the spirit of the scientist; he lays the foundation of a grand branch of science for you—therefore, to build, you must labor, too, and to labor, is to study. Schools of instruction should be opened in every large city; every medical and physical college should install an apparatus and teach students its use and value! Luckily our city is the pioneer in this direction, we have a school where physicians can study the process of radiography, and I have no doubt, the practitioners who have studied there, can appreciate my remarks.

With proper men at the rheotome and tube, radiography will yet become the all important branch of surgery—without them it will die an ungrateful, unappreciated death!

For whom shall radiograms be made? They should be made by the physician, that is, an electro-medicist, and be made for the physician and surgeon!

This assertion leads on to important questions relative to legal cases. In the first place, the specialist called upon should be a man entirely conversant with anatomy and pathology—you will at once note the importance of this—for this reason: If the patient is brought to you by the attending physician he requires you to make radiograms of certain parts of the body, to show, if possible, the cause of deformity and pain or loss of locomotion. Now just imagine how the operator would feel under the circumstances, not understanding a word of the statements made. Even should the physician overlook the matter, it becomes the source of considerable doubt, as to the findings, *in the radiogram!* There is such a fact, as *understanding the negative*, as every radiographer will acknowledge. Again, the radiograms have been completed; the patient brings his suit into open court, and you appear before a severe counter-counsellor, a critical judge and an interested jury—imagine how poorly your broken unapplied knowledge will impress the jury and the court, even should your improper statements, on general belief be accepted. Is it correct? Is it over, or underrated? Is it fair? I say, No! It can not be either one or the other! Only lately, I was called into a case to interpret the findings in a doubtful radiogram for a so-called electrician—a bell-hanger perhaps, from what he knew of the parts involved. All he knew was, that a bone should be straight and unbroken, except at the joints. Such a pipe-stem arrangement of bones seemed to make up the whole body! This is only a picture—an illustration of what can occur! Now picture yourself, an electrical expert calling iodoform packing a shattered bullet; the sesamoids, broken bone ends; an epiphesial separation, a fracture, etc., etc. There is no end to these questions.

Therefore, again I say, let the specialty as used in medicine and surgery, be applied by medical men, who are fully acquainted with this important branch of service, and who know, and know *well*, whereof they speak!

Borough of Brooklyn, G. N. Y.

APOSTROPHE TO THE DOLLAR.—An editor has been inspired, after looking over his list of delinquent subscribers, to compose the following: "How dear to our heart is the silver dollar, when some kind subscriber presents it to view; the liberty head without necktie or collar and all the, strange things which to us seem so new; the wide spreading eagle, the arrows below it, the stars and the words with the strange things they tell; the coin of our fathers, we're glad that we know it, for some time or other 'twill come in right well; the spread-eagle dollar, the star-spangled dollar, the old silver dollar we all love so well."—*Life and Health.* Jan. 1898.

THE EFFECT OF ROENTGEN RAYS ON PLANTS.

Prof. G. F. Atkinson, of Cornell University, publishes in the January 7 number of *Science* a "Report upon some preliminary experiments with the Roentgen rays on plants," from which the following extracts are taken: Since it is a matter of some interest to know what influence, if any, the Roentgen rays would exercise on plants, I undertook a series of somewhat extensive preliminary experiments to determine what lines of investigation might profitably be carried on should there be marked indications of any response to possible stimuli from this source.

The author then describes twelve experiments in which he used the following substances: Leaves, seedlings of corn, a begonia plant, a caladium plant, species of mucor, several forms of chromogenic bacteria, a motile bacillus, sensitive plants, etc., and draws the following conclusions: It is thus seen that plant tissues absorb the Roentgen rays quite freely, and it is singular that there is not a more marked influence on growing parts, especially that there are no visible external injuries, even when the parts are exposed at close range a large part of the time during several days, since the general impression is that the rays, even with comparatively short exposures, are injurious to the human tissues.

The longer his experiments continued the more mysterious the whole subject seemed. On a dark night, when the electric light rays were intercepted by a black screen, exploring the field with a fluoroscope there was an abundance of light, flashing and quivering with the variations in the electric transmission through the tube, penetrating, and yet capable of absorption to a considerable degree. That it should present no easily discernible influence for the time during which the work continued was cause for profound surprise.

SKILL EASILY ACQUIRED.

BROOKLYN, N. Y. March 3, 1898.
EDITOR OF THE AMERICAN X-RAY JOURNAL:

After each article I have published during the past year and a half about x-ray work I have received letters of enquiry in which the writers refer to "the wonderful results I mention," etc. My article entitled "Burns and Technique in X-Ray Work," in your Feb. number has beeu no exception to the rule, and I beg your permission to say to your readers that the results mentioned were of very *commonplace* character. None of the results reported in that article deserve to be called "wonderful", for they are only ordinary practical work. At this stage of x-ray work it is disappointing to find that so many physicians write me that they "are getting no such results and regard them as almost beyond belief". I can only say that they are within the reach of every medical man who adopts a correct technique and who will provide himself with efficient apparatus of any kind. There is no trick or secret about it and the intelligence of a child ten years old would be quite equal to acquiring the necessary skill. Allow me to say in closing that the most brilliant results that I frequently obtain are never set forth in my published writings for the reason that I value my reputation for conservatism and adherence to facts, and I never print what I can not demonstrate to each and every physician who comes to me for instruction.

Very Truly,
S. H. MONELL.

EFFECT OF CATHODE RAYS ON AIR. LENARD. "WIED. ANN.," 63, p. 253; noticed briefly in the *Am. Jour. of Sc.*, Feb.—He shows that these rays form regions of mist condensation far more powerfully than x-rays do.

Is There a Relationship Existing Between The X-Ray and the Luminating Power that Obtains in Telepathic Vision?

BY J. J. FLY, M. D.

This may seem to be a very strange question to those who do not know from experience anything of the mysterious faculty of telepathy; and those who do not yet believe that this wonderful occult faculty is a part of the make-up of human beings, may think strange of a man who would propose it. Yet, in these days of strange innovations and wonderful results of experimental investigation, the majorities have become resolved into the status of not being surprised at anything, but simply pose in silence and watch results and verifications of the claims that are being made. I am glad that this is so; I am glad that the disposition to ostracise anything new, and bring into disrepute the originator, is fast becoming a relic of the past. It shows that the world is open to investigation and that man has at last conceded the right to every individual to think along the line to which his mind naturally inclines. With these rights conceded and the shackles broken that have hitherto bound down the creative powers of the mind to old creeds and dogmas, there is nothing to obstruct the genius of man from sweeping into boundless infinity and fearlessly facing and interrogating every phenomenon that addresses itself to the human mind. But the methods of investigation themselves become a question of grave import. How is it that we know a thing? and how do we come to know? What is knowing? This is the most wonderful question, and involves more than any other. I think we may safely say: "The reason why the material world is intelligible, why we can interpret the signs it gives us, is because there is an intelligence behind the universe which has been and is related to the universe. The trend of materialistic science is to abolish faith, and pose upon demonstrated facts; but it only takes a few moments of meditation to determine that we can not know anything without transcending the phenomena upon which the knowledge is based, and bring to bear upon our conscious entity, the potencies of faith. Science says, the truth of knowledge rests upon experience and observation; but here again the interposition: What of the methods? What of the sensations that lend our intelligence to confirm or deny a given proposition? and what is this sensation, and how did it reach our intelligence? These questions are legal notwithstanding their metaphysical character, the solution of which has ever been a task before human intelligence. The convictions of knowing are evinced by certain states of consciousness, certain symbols—signs evoked in our minds by events happening in the universe outside our minds. We do not really know anything of things within themselves; we do not perceive the actual world around us, nor anything like it; what we see is not any more tangible than the emotions we feel.

The sensation of sight is not in the retina, it only bears an image of external things which become resolved into a conscious sensation in some mysterious manner through the avenues which impress the living, acting, cellular structure of the gray matter of the brain. Therefore all sensations coming from the impact of undulating, vibratory or pulsating ethers, every conscious fact relating to the external or internal world, can be only psychologically regarded.

But we started out to discuss the comparative analogies existing between the x-ray and telepathic vision, having witnessed the light and studied its peculiarities.

I thought I might make a declaration of my experiences and at the same time

establish a favorable conviction in the minds of others by showing up what appears after having had some experience in both, an analogy between them. And, while dealing with the phenomenal characteristics growing out of these inner sources of light, impinging upon the conscious mind. We almost tremble in anxious hope that we shall reasonably find the one to be an analogue of the other, instead of an analogy existing between two entirely different things. We are fully aware of what this means; of the new world it would open up, and the relations it would establish between the outer and the inner being—between materiality and spirituality. It would show that the universe had its counterpart in the invisible, with similar tangible relations to conscious entities adapted to its more ethereal environments. If such a hope as this should be rebuked, it would be nothing new. Has not every great truth been opposed? Such is the history of the past. Let us follow a few of the steps made by experimental research in the unfoldment of the different forms of light, together with their adjustment to human powers of co-ordination. We are not interested in the nature and source of light, as these form no part of our subject. It being the different forms or phases taking place in this great force, and the law that governs it as applied to the perceptive powers of man that more particularly interests us at present. My proposition here affirms that there are different forms or manifestations of light and we wish to show how beautifully nature economizes her powers in her transmissions from one medium to another while she retains the same principle through the whole transformation. The principle of evolution is as beautifully illustrated in the trajections of light from one medium to another with its co-ordination to the perceptions of the human mind as could be. We hope to illustrate our position by the following short history of the different manifestations and properties of light. It has been said of light, "That it reveals the glories of the external world and yet is the most glorious of them all. It gives beauty, reveals beauty and is itself most beautiful. It is the analyzer, the truth teller and the exposer of shams, for it shows things as they are. Its infinite streams measure off the universe and flow into our telescopes from stars which are quintillions of miles away. On the other hand it descends to objects inconceivably small and reveals through the microscope objects fifty millions of times less than can be seen by the naked eye." Yet, as the investigation of light goes on, the more wonderful are its phenomena, the more amazing is its power, and the greater the mysteries it reveals. It was no doubt incontrollable impulses akin to the above, that awakened the sublime powers in the mind of Newton to strike the key-note to the proper methods in the investigation of light, and from which he evolved his molecular theory; and while the undulatory theory is more generally accepted, it appears that any one can see its utter inability to explain one of the most important phenomena of light, viz.: its dispersion into its component parts. Before Newton, the ancients had learned that light moved in straight lines, they knew that rays were reflected from polished surfaces and the angle of incidence was equal to the angle of reflection; they also knew that an opaque body interrupted these rays. Snell discovered the law of refraction which became the chief corner stone of optical science. It was while Newton was experimenting with this law of light through a prism in the window shutter of his room that he disdiscovered that light was a compound body and consisted of seven colors which is called the solar spectrum. He verified this fact by again condensing the colors and focusing them into white

light. Newton thought that we could not have dispersion without refraction; his experiments led him to think so; but Dolland subsequently proved that he was in error. However, Newton's experiment has established one of the greatest truths, by showing that natural objects have no color of their own; but that their action is limited to colors that are showered upon them. How wonderful! What a field of light was thrown upon the subject of this great law of force that illumines the external world giving it its various tints, colors and shades of colors, as we see chromatically arranged in hill, dale, and the mountain range; in the grasses, flowers and foliage; in the pigmental expression of the human race and the iridescent hues of the lower animal world.

It was through this problem solved by Newton that science bounded forward through many centuries in a single day and set the scientific world thinking along the line of legitimate conclusions. The phenomena of light that we have just enumerated we will call ordinary light, adjustable to the organs of light perception (the eyes) through which the radiant beauty, harmony and incongruities of the external world are reflected into sensations upon our psychic natures, and by which objective nature may be realized and studied together with the intelligence that is related to it.

Let us now take our second step into the ultimates of light; the second step in the line of its unfoldment of its greater powers and capabilities as has been evinced by experimental research. It has been proven that the eye is not commensurate with the whole range of solar radiation. Above the visible spectrum it has been found that there are other spectra of color. Stokes has counted ten octaves above the violet and Muller has demonstrated two below the red. This fact could not have been discerned without an intervening medium between the eye and this more refined ethereal light; consequently a substance that neither transmits nor absorbs light was exposed to these invisible rays and their presence shown by converting them into another kind of light—a fluorescence that could be perceived by the eye. Thus we have found that our second step above the ordinary is made easy, and can appreciate Tyndal's thought when he said: "If we allowed ourselves for one moment that notion of gradual growth, amelioration and ascension implied by the term evolution, we might fairly conclude that there are other visual impressions awaiting man far greater than those of which he is now in possession. For example, beyond the extreme violet of the spectrum there is a vast efflux of rays which are totally useless as regards our present powers of vision." We will say in regard to this thought, that we have dared to embrace that hope; that we believe that nature has not made a single ray of light or a single entity in her grand emporium that is not adapted to some of the perceptive powers of the soul of man. Man is a microcosm!

From the ulterior rays let us proceed to the third step up the ladder of the evolution light. Here we meet the cathode rays. Lenard, in the investigation of the cathode rays with a view of determining their nature, concluded they did not differ from the nature of ordinary light. It will be remembered that the cathode rays produce a phosphorescent glow from the bombardment of the remaining particles of air in the tube, their collision with one another producing light; but on exhausting the tube to one-millionth of an atmosphere the purplish cloud on the inside has disappeared and the interior of the tube is clear, but the glass itself has become fluorescent from the bombardment of the remaining molecules of air against the walls of the glass. (A. B. C. of the x-rays). Hertz

showed that the cathode rays passed through thin sheets of metal placed within the tubes and Paul Lenard established their existence on the outside ; that they could pass through substances opaque to ordinary light and cast shadows of other objects less opaque and that these shadows might be impressed upon an ordinary photographic plate and be developed in the usual manner. His investigation showed that these rays possessed all the properties of ordinary light with the exception that they were unperceived by the eye, and that they possessed greater power of transmission through solid bodies that were opaque to ordinary light. As it is only this property that we wish to call out as belonging to these rays, we will not ask space for a further interview of the literature upon their nature, excepting to make the statement that the conditions under which they have been adjusted to the higher functions consummated by them are also different from those that obtains in the atmospheric media through which ordinary light is impressed. There appears to be only three dimensions of space, but if there is anything in "Algebra c Variables" there can be no such limitations.

The extreme rarefied condition of matter that obtains in Crooke's tubes has been called by both Faraday and Crookes radiant or the fourth state of matter ; that is, matter whose molecules are "relatively as far apart as compared with those of gas, as the molecules of a gas were as compared with those of a liquid." Thus while we have here a still finer degree of light, we find it arising in a medium more ethereal and spiritual than the medium of ordinary light and one that is adjusted to it in perfect adaptation as far as can be determined.

The fourth and last step to which the genius of man has reached, is the x-ray. We have not space to review the literature upon its source or to discuss the probability of its being a pulsating stream of ethereal atoms. We are inclined to accept that it is anticathodic in its origin ; that it originates from the fluorescent spot on the wall of the glass opposite the cathode plate, and emanates from the bombarded surface. It differs from the cathode rays, which seem to rise from the cathode plate, in possessing greater power of penetrating opaque substances. It has been found to differ in some other respects, viz.: that the air absorbs a much smaller fraction of the x-ray than it does of the cathode and that the fluorescent effect of the x-ray is observable two feet away from the discharge tube which is not observable of the cathode ; that other bodies are more transparent to the x-ray than to the cathode, and that the x-ray is not deflected by the strongest magnetic fields, which is not so with the cathode ; that there are different kinds of cathode rays distinguishable from one another by their pho phorescent powers, absorption and magnetic deflection. Roentgen calls it a ray because of the very regular shadows it forms on the screen. The nomenclature we have adopted here in the classifications of different grades of light, from the coarser to the finer, from the ordinary to the inordinary, may be correct or otherwise ; but, be this as it may, it can not be disputed that we have shown from experimental investigation that there is an evolution of the phenomena of light which reaches into states or conditions that the ordinary powers of vision can not utilize by ordinary methods ; it has also been shown that the objective mind can not even know of these higher modifications without studying them through a medium which serves to bring them within the functional range of objective sight. Now, with the intervention of this medium, the phosphorescent screen, it follows that there is not an organ in the human body that may not be seen and studied with the natural eye. How wierd and

strange does it sound to say you saw the waving motion of the heart, as it forced the blood current through the vessels of the human body that stood by your side, alive and well, and with whom you were engaged in conversation. Moreover, the blind have been made to see and read, and further, those who never knew what the sensation of sight was like, have been blessed for the first time in life with that knowledge.

Further, it has been demonstrated by the application of these finer ether streams that there are other avenues for the transmission of light to the organs of light sensations in the brain than the retina and optic nerve. The evidence has come in a way that clearly points out the fact that every pore of the human cranium is an open window from which the soul may look out upon the common world and common things and by changing its focus just a little behold the transcendent beauties of a more ethereal state. It is here that telepathy begins; but we reserve its consideration for the next number of this magazine.

IS GRAVITATION EARTHLY MAGNETISM?

BY W. R. D. BLACKWOOD, M. D., PHILADELPHIA, PA.

Magnetism acts on iron actively, on steel less powerfully and to a small degree on other metals. It has no effect whatever on textile stuffs such as cotton, woolen, hemp, etc. Gravitation is a force which compels every known substance to fall to the earth unless supported by such means as will overcome the attraction of gravitation. A tin pail with the engineer's dinner in it may stand by the most powerful dynamo, whose fields are saturated magnetically to such a degree that all iron or steel within a considerable distance will be drawn to it, yet the pail lies quietly within an inch of the active poles; let, however, the support on which the pail rests be withdrawn from beneath it and the dinner falls to the ground at once. This shows another force than magnetism altogether. So with every known substance on earth; thousands of differently constituted objects—stone, wood, cheese, oysters, fruits, books on electicity or theology, and millions of other examples—none of such will move a particle toward any magnet, yet they all fall to the earth if not held above it by artificial support. The earth's magnetism is produced, it is now believed, by the friction of the tides, the friction of air-currents, the revolution of our globe on its axis, etc.—*i. e.* by deduction. The difference in potential at differing points, and also at the same points at different times is due to the conductivity of the metallic strata underlying the surface which transmit the currents toward or away from the points of friction or induction, just as in artificial batteries or mechanism used to produce electric force, *i. e.* to send the force along given conductors, for we do not *make* electricity at all, we simply send it hither and thither precisely as the pump makes no water, but lifts or forces the fluid from the well to its destination. The atmosphere is always charged electrically, sometimes more powerfully than the earth beneath a given locality, owing to currents being driven aside as the clouds move in the wind. Now if magnetism is gravity, then articles would be hauled up at such times into space instead of going to the ground. Even when the atmosphere and earth are at equi-potential gravity acts just as it does when the earth charge is the stronger. The varying charge is adjusted through storms, when lightning equalizes the polarity and the static capacity also. Gravitation acts equally on all objects at all times, notwithstanding the condition of the earth's charge; hence, as magnetism is a form of electric force, were gravitation magnetism it would vary continually as the potential varied. It never varies.—*The Medical Summary.*

THE X-RAYS IN OBSTETRICAL DIAGNOSIS.

Levy and Thurnim record a method of measuring the dimensions of the pelvis by means of the Roentgen rays. (*British Medical Journal.*) Previous attempts had been made by means of plates introduced into the vagina, and had failed on account of the limited space and the length of exposure required. The authors place the patient horizontally over a plate twelve by sixteen inches in size, and set the tube vertically over the symphysis, and exactly twenty inches above the center of the plate; an exposure of two to five minutes suffices to give a satisfactory skiagraph, on which the pelvis is faithfully represented. This is measured, and as the distance of the tube from the plate is known, the pelvic dimensions can be accurately computed. To facilitate this Levy has designed an instrument on the principle of the pantagraph, by which the true conjugate can be mechanically determined. The transverse diameters at the brim and outlet can be estimated with equal certainty, and the method has been satisfactorily tested in a number of cases in Landau's clinic. Further investigations have been carried out by the authors on pregnant women with flat pelvis in order to ascertain the dimensional relations between the fetal head and the pelvic outlet, but the results are not at present unobjectionable; further research is being undertaken, and a satisfactory and practical outcome is anticipated.

New Hints for Radiography.—Marcus states that iodoform, vaseline and iodoformed ether introduced into deep cold abscesses, form a mixture with the contents of the abscess impermeable to the Roentgen ray. Also that insufflation of air into hollow organs renders them perfectly transparent to the ray, which fact can be utilized in obtaining information in regard to the stomach, or the intestines insufflated from below, as they leave a blank space on the plate.—*Presse Med.*, Nov. 27.

The Roentgen Rays.—During 1897. great activity has been displayed in the perfection of radiographic and fluoroscopic apparatus with the result that those who are expert in the invention and practical employment of such apparatus are enabled to secure clearer and larger pictures than ever before. The rays have proved of value in the detection and sometimes the rectification of obscure deformities following fracture and dislocation, in the location of foreign bodies in the body, and in particular in the esophagus and other portions of the gastro-intestinal tract. Foreign bodies in the eye have been successfully located by their use.

The work of their application to the diagnosis of internal disease, particularly of the chest, has been actively pursued during the year, and they have proved of value in the diagnosis of thoracic aneurisms and other tumors, tubercular processes in the lungs, and in accurately mapping out the extent of cardiac enlargements. With regard to proving of service in the early diagnosis of phthisis, it may be said that, in the early stages when the disease is simply a catarrhal bronchitis at the apex, for instance, and no solidification has occurred, the interference with the rays would hardly be sufficient to produce a shadow, although the stethoscope would reveal the presence of fine crackling rales.

It is improbable that the rays will prove of value in the diagnosis of phthisis in the early and therefore most important stages, until the apparatus is perfected so that it will bring out much finer differences in the consistence of tissue than it does at present.—*The Virginia Medical Semi-Monthly.*

AN X-RAY PICTURE OF A LOADED LEBEL RIFLE.

Professor Roentgen has shown that the x-rays are disseminated in the bodies which they traverse similarly to light passing through distorted media. Recently the importance of this discovery has been more fully recognized in regard to the disturbances which are produced in certain radiographic operations.

When a very opaque object, like a large watch, is interposed between a powerful Crooke's tube and a photographic plate, the x-rays are powerfully disseminated in the space which they traverse behind the plate, making impressions on the back, that is the side of the glass which carries the sensitive film. This impression, or shadow, increases uniformly with the duration of exposure. The result is that a relatively short exposure gives a faint silhouette of the mechanism of the watch, but the impression seems a trifle blurred. The value of the impression at first increases with the time of exposure, but this reaches a certain limit when the impression rapidly grows bigger under this double radiation and becomes more and more gray until all the details of the silhouette are lost.

It is evident that one can prevent the shadows of the return rays when, in getting ready for the experiment, a sufficiently opaque screen is placed against the back of a sensitive film. A sheet of lead half a millimeter in thickness is ordinarily sufficient. This thickness can be increased in exceptional cases.

This precaution is not necessary when a little less powerful tube is employed, because the glass on the back of the plate is then sufficient to arrest all the return rays. For the radiographs of very opaque objects requiring very long exposures, placed in front of powerful tubes, it has been found expedient to use a sensitive preparation of loose films of double commercial gelatine and lay them on lead sheets of the same shape, enclosing the whole in black paper whose object it is to arrest the ordinary rays of light.

The role played by the black screen is clearly brought out in a radiograph of a large watch obtained after an exposure of two minutes at a distance of 12 centimeters from a very powerful tube, only half of the back being protected against the return rays by a metallic screen. The protected part gave a very detailed silhouette of the interior mechanism, whilst a thick shadow conceals nearly the entire other half.

This may explain the numerous failures which have been met with in even the best radiograph work designed for the study of very opaque substances in the human body and of metallic objects generally.

By using a back screen, there are obtained, for example, all the details of construction of cartridges. The hunting cartridges, for example, allow the experimenter not alone to see the arrangement of the charge, of the wadding and the nature of the powder, but also the irregularity of the metallic socket, the form of the capsule and the position of the trigger.

A copper pistol and a revolver which will not produce a shadow by the old methods, exhibited the balls clearly in

place when the back screen was employed as described. This has helped the experimenter to obtain also several radiographs of a Lebel gun by relatively short exposures, these having been, at 20 centimeters, 10 minutes for the locking parts, and 1 minute for the other parts. Referring to the figure, one can clearly see through the two steel jaws, the swinging tray, and the cartridge which it contains ready to pass into the barrel. Eight cartridges can be distinguished at different angles and all pressing in line against the coiled spring which pushes them forward.

One can finally distinguish that these cartridges are of the kind used by shooting clubs, as the powder is granulated and not "ribboned" like that which M. Vieille uses for cartridges for warlike operations.

The above data is part of an article contributed to *La Nature* by Abel Buguet, Professor at the School of Sciences and the School of Medicine at Rouen.—*Electrical Engineer, N. Y.*

THE APPLICATION OF THE X-RAYS TO THE DIAGNOSIS OF TRAUMATISMS OF THE ELBOW.—The diagnostic value of the skiagraph in cases of injury involving the elbow-joint is fully appreciated by QUENU (*Rev. de Ortho.*, July, 1897), who reports a case that had been diagnosticated by one physician as a posterior luxation, and by another as a fracture. At the time he saw it the oedema was so great that it was impossible to determine exactly the relations of the bones; the olecranon alone was accessible, and it appeared to be in its normal position, or at least only slightly elevated. The contraction of the muscle prevented the least motion without intense suffering. A skiagraph was made, and the ulna was shown to be in a state of subluxation, the former attempts at reduction having been only partially successful. He succeeded readily in reducing the luxation, but there was so much swelling that it was impossible to definitely determine when the reduction was complete. A second skiagraph showed that full reduction had been secured. The author says that the painlessness of this diagnostic method, its certainty and harmlessness make it of great value and almost a necessity if the surgeon would treat fractures involving joints with the greatest care and precision.

ELECTRICITY AND THE MYSTERIOUS.—The general comprehension of electrical phenomena which exists in the lay mind is rapidly becoming greater with the constantly increasing use of electrical apparatus in every day work. There exists still, however, a tendency to ascribe nearly everything that is mysterious or unaccountable to electricity. Nearly every fire whose origin is unaccounted for is laid to electric wires, although in all probability gas is a much more dangerous incendiary than electric current as now used. The daily papers, realizing this peculiarity of the public mind, cater to it by attempting to bring in electrical causes for everything not obviously explainable on other grounds. The recent destruction of the battleship Maine by an explosion, the cause of which is unknown, has given ample opportunity for many able theorists in the electrical field. One paper states that the explosion was due to the short circuiting of a dynamo, and another that it was due the "explosion of the boiler of the dynamo machine." Many hypothetical causes have been evolved tending to show how the damage might have been inflicted by interested persons, by means of wonderfully contrived electrical devices. The electric detonator and push-button, alleged to accompany it, have received great prominence, while the time fuse and percussion cap have been neglected.—*The Electrical World.*

THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.

The seventh annual meeting of the American Electro-Therapeutic Association was held at Harrisburg, Pa., on September 21, 22 and 23. Dr. W. T. Bishop, of Harrisburg, being President. Among papers of interest and importance to the general practitioner, as well as the specialist in electro-therapy, the following were read: "Electric Treatment in Gout and Uric Acid Diathesis," by Dr. R. Newman, of New York, who presented the advantages of static electricity in these conditions; urinary analysis were submitted substantiating his claim. In "Chorea," by Dr. F. T. Bishop, of Washington, static electricity was again set forth as a very valuable aid in treatment. "Sources of Atmospheric Electricity," by Dr. R. J. Nunn, of Savannah, Ga., had for its object the suggestion to practical students of physics to test with mechanical devices the correctness of the theory that the solar system acted as a vast static induction machine, producing by its motions a difference of stress or potential. "Some Thoughts and Considerations on X-ray Work," by Dr. E R. Corson, of Savannah, Ga., gave many valuable ideas. The writer thought that the x-ray was destined to be even more valuable in dislocations than in fractures; he suggested that a careful outline tracing of the negative by transmitted light, all extraneous light being shut off, would enable the eye to pick out the essential features more readily than from the usual radiograph. Experiments in diagnosis were given, and radiographs presented showing that the x-ray penetrated urate of soda much more readily than bone. In "Some Considerations Relative to the Therapeutic Application of the Current," by Dr. G. E. Bill, of Harrisburg, many suggestions, especially as to polarity, were thrown out. "The Early Electrolysis of Naevus," by Dr. C. R. Dickson, of Toronto, set forth the advantages of operating in early infancy, when the operation was much more simple, and the chances of scars much less than when the patient was of mature years. Dr. E. H. Coover, of Harrisburg, gave many suggestions as to the most appropriate methods of treatment in "Heart Failure in Cardiac Diseases due to Defective Circulation." "Expenditure of Electrical Energy," by Dr. Margaret A. Cleaves, of New York, was accompanied by a large number of clinical records illustrating the value of accurate dosage of electricity, as knowledge of the rate of current flow was necessary, as well as the time of flow in order to apply electrical methods intelligently. Professor Dolbear, of Tuft's College, Boston, gave a masterly paper on the laws governing molecular motion, entitled "Molecular Effects of Electricity." He considered that the molecular effects produced by what we call electricity, are really due to heat. "The New Electro-Mercuric Treatment of Cancer," by Dr. G. B. Massey, of Philadelphia, was a further elaboration of a paper read before the American Medical Association in June last. The treatment was only applicable where the disease was still local. Mr. E. Jewell, E. E., of Chicago, presented "Current Regulating Apparatus," describing methods of controlling dynamo currents and adapting them to therapeutic uses. "Galvanism as an Aid in the Treatment of Goitre," by Dr. C. Brown, of Sac City, Ia. Mild constant currents frequently repeated were found beneficial. In "Further Studies of the Manifestations of Uric Acid, and their Treatment, Electrically, and Otherwise," by Dr. J. Griffith Davis, of New York, the writer laid special emphasis on the statement that uric acid and its salts are the result of product of nerve and muscle waste. Electricity, the bicycle and woolen clothing next the skin, were

methods of prevention. Dr. Lucy Hall-Brown, of New York, sent "A New Electrode for Use with the Static Machine," which was read by Dr. Nunn. The electrode was a wire brush, of about four hundred fine steel wires mounted on a handle, and by means of it an efficient spray current could be administered. Dr. J. Bergonine, of Bordeaux, France, sent three communications: (*a*) "A New Localizing Electrode to prevent the Diffusion of the Current," (*b*) "Palliative Treatment of Tic Dolcureaux of the Face," (*c*) "The Action of the Roentgen Rays on the Vitality and Virulence of Koch's Bacilli in Cultures." These papers were translated and read by Dr. F. Schavoir, of Stamford, Conn., (*a*) eight or ten narrow electrodes were connected alternately with the positive and negative poles, none but a very intense current could become diffused; (*b*) a large electrode is used on the face and an indifferent electrode on the dorsal region. A continuous current of fifty volts and thirty to fifty milliamperes is employed, and the periods of the ascension and diminution last from seven to ten minutes, the maximum intensity should be maintained for at least twenty minutes; (*c*) the exposure of the culture for one hour did not destroy the virulence of the culture, but retarded its development, the vitality of the culture was not modified. Very interesting reports were presented by the Committees of Investigation as follows: "Meters," by Dr. M. A. Cleaves; "Electrodes," by Dr. C. R. Dickson. On the recommendation of this committee the metric system of measurement was adopted by the Association. "Electric Light for Diagnosis and Therapy, and the Roentgen x-rays," by Dr. F. Schavoir. The president's address dealt with the past history of the Association, and suggested several changes that might increase its efficiency while lessening the work of the Executive. On motion of Dr. C. R. Dickson, it was resolved that the Executive Council should be directed to consider the suggestions of the president, and also the revision of the constitution and by-laws. Buffalo was chosen as the next place of meeting, on Tuesday, September 13, 1898, and two following days.

The following officers were elected for the ensuing year: President, Dr. Charles R. Dickson, of Toronto, Canada; First Vice-President, Dr. F. Schavoir, of Stamford, Conn.; Second Vice-President, Dr. Caleb Brown, of Sac City, Iowa; Secretary, Dr. John Gerin, of Auburn, N. Y.; Treasurer, Dr. R. J. Nunn, of Savannah, Ga. Exec. Council: Dr. Robert Newman, of New York, N. Y.; Dr. William J. Morton, of New York, N. Y.; Dr. William J. Herdman, of Ann Arbor, Mich.; Dr. William T. Bishop, of Harrisburg, Pa.; Dr. G. Betton Massey, of Philadelphia, Pa.

After the customary votes of thanks had been passed, Drs. Newman and Nunn conducted the newly elected-president to the chair. Dr. Dickson, on receiving the gavel made a very happy address, and requested the active assistance of each member in order that the meeting in Buffalo might be the most successful yet held. He would appoint the committees on the investigation of scientific questions, at the earliest possible date.

A very fine exhibit of therapeutic, diagnostic and x-ray apparatus was held in the Academy of Medicine, also under the auspices of the Association, and many demonstrations of a particularly interesting character were given by the exhibitors during the sessions.

The Association is to be congratulated upon the success of the meeting.

THERE are two hundred and seventy-five medical journals in the United States, with a combined annual circulation of 16,017,200 copies.

X-RAYS.

BY J. M. SCOTT, M. D., KANSAS CITY, MO.

The so-called burning is an electrolysis and is not caused by the x-ray at all, but by the current of electricity.

The current used for exciting a Crooke's tube has a voltage or pressure of from one-half to one million volts and a very small amperage or quantity. Now if you hold any part of the body within one to six inches of a wire carrying such a high voltage of electricity, whether for exciting a Crooke's tube or not, or near an excited Crooke's tube, there will be a current of electricity passing to the part exposed. If the exposed part is very near the current will feel like a very slight breeze of air blowing against the part and if held a little further away it can not be felt at all, but is passing just the same. If the part is held within an inch or closer, the electricity will jump to the part in the form of the spark, which will produce a stinging sensation. Exposing for a minute or two, even if close will not produce an electrolysis, but if a part is exposed for five minutes within two or three inches, or for twenty minutes at four to six inches, it will generally produce an electrolysis, the severity depending on the strength of the current. A tube generating an x-ray which would just penetrate a body if held four inches from it, would not penetrate it at all if held ten inches away. From this it will be seen it would be possible to take a picture with an inefficient, weak apparatus if the tube was held four inches away, while it would not if held ten inches away, and if the apparatus was so weak, it would take a long exposure and be very liable to produce an electrolysis. However, if using a good apparatus there is no necessity of holding the tube closer than ten inches. A current of so great power as of two million volts can not pass to the part exposed if placed seven or more inches away, and if the current of electricity can not pass more than seven inches it can easily be seen that electrolysis or so-called burning can not take place and there is absolutely no danger in using the x-ray if the part exposed is held seven inches or more from the tube and conducting wires. Electrolysis can be produced with a physician's galvanic battery if the current is concentrated by using a small electrode on the body in one place for some time.

I operate a Crooke's tube on an average of one hour every day, and stand within about two feet of the tube and have never noticed any effect.

The strength of the x-ray decreases as the square of the distance increases, so it will take just nine times as long to take a picture at fifteen inches from the tube as at five, because fifteen is three times five and the square of three is nine.

The length of exposure in taking a picture also depends on the thickness. For example if it takes one minute to take a picture through a hand one inch thick, to take an arm five inches thick it will take five minutes exposure. Of course the tube in both cases would have to be the same distance from the plate. —*Kansas City Medical Index.*

PHOTOGRAPHY WITH ROENTGEN RAYS.

There can not be said to have been, hitherto, any general agreement among experts as to the best plate to use for Roentgen photography. Experiments described by J. Gaedicke in the *Photographisches Wochenblatt* throw a considerable amount of light on this question. Two ordinary dry plates were taken, and one was dipped in erythrosine of silver to render it isochromatic. Over these two plates was placed a composite screen divided into five sections, one of which was coated with barium platino-cyanide,

the second with Kahlbaum's tungstate of calcium, the third with A. E. G. tungstate of calcium, and the fourth with the double fluoride of ammonium and uranium, the fifth section being left uncoated. After an exposure of thirty seconds the plates were developed, and a considerable difference in the density of the impression made by the five sections was found to exist. The conclusions drawn from the experiments were as follows :

1. The orthochromatic plate shows a much stronger action than the ordinary without the screen, and it increases the action of all the screens. It is thus shown that for the x-rays only erythrosilver plates should be used. The increased action should be ascribed to the fluorescence of the erythrosine.

2. The fluoride of ammonium and uranium reduces the action of the rays to one-half on the ordinary plate, and to about two-thirds with the orthochromatic plate, and ought not, therefore, to be used for this work.

3. The calcium tungstate of the Electricitats Gesellschaft (A. E. G.) doubles the action, and Kahlbaum's preparation quadruples their action on ordinary plates, and gives a yet greater action on orthochromatic plates.

4. The platino-cyanide screen gave a very interesting result. With the ordinary plate—which, as is well known, is very sensitive to yellowish-green light—there was no intensifying action, but just the reverse; the screen reduced the action by one-half. From this it follows that this screen had converted the greatest part of the x-rays into yellowish-green fluorescent light. The orthochromatic plate showed the most intense blackening of all.

A similar series of experiments is described by A. E. Livermore in *Photographic Scraps*. In this case an Ilford special plate and an isochromatic plate were used, and native tungstate (sheelite), double fluoride, and platino-cyanide were used on the screen. Livermore's results agreed with those given above, in showing that the most efficient arrangement was an isochromatic plate with a platino-cyanide screen, but they differed *in toto* as to the effect of the double fluoride of uranium and ammonium. This, according to Livermore, gave almost as good an effect as the platino-cyanide, and he recommends it as being the best to use when cost of material is a matter of importance. Both experimenters agree in saying that the isochromatic plates are in general superior to ordinary plates for Roentgen photography.—*Journal of Electro-Therapeutics.*

Table of Absolute Air Pressures and Densities at Various Altitudes above Sea Level.

Altitude. Feet.	Absolute Pressure. Lbs per sq. inch.	Density. —
Sea Level.	14.7	1.00
1,320	14.0	0.96
2,640	13.3	0.91
3,960	12.7	0.86
5,280	12.0	0.82
6,600	11.4	0.78
7,920	10.9	0.74
10,560	9.9	0.67

NOTE.—Absolute pressure is the pressure above a vacuum; gauge pressure is the pressure above the atmosphere. To convert ordinary gauge pressure into absolute pressure, 14.7 lbs. must be added.

Absolute pressures are always to be used in questions relating to temperature and expansion of steam, air and gases.

No SURGICAL consulting room is fully equipped without an apparatus for x-ray examination. The surgical practitioner will consult his own and his patients' best interests by employing an apparatus which is also of great therapeutic value.—*Manual of Static Electricity in X-Ray and Therapeutic Uses.*

Send $1 for a year's subscription to THE AMERICAN X-RAY JOURNAL at once.

INTERNATIONAL HEALTH EXPOSITION.

An International Health Exposition is planned to take place in New York City, April 25 to May 31 in the Industrial Building known as the Grand Central Palace, Lexington Avenue. Mr. Charles F. Wingate is to be Supervising Director and the exhibition will enlist the co-operation of the New York Household Economic Association, the Brooklyn and New York Health Protective Association and other kindred organizations.

The classification embraces Domestic Sanitation with 11 groups; Municipal Hygiene with 20 groups; Food Products, Health Resorts and Sanitariums; Hygienic Literature; Sanitary Organizations and their work; Progress of Preventive Medicine; Military and Navy Hygiene; Animal Sanitation; Industrial Hygiene and Fire Protection. A series of popular lectures will be provided daily during the exposition, in a separate lecture hall.

Tickets will be sold at nominal rates to employers of labor, who will be asked to distribute them among their workmen. An effort will also be made to interest the residents of the tenement quarters of the city in the exposition. The scope of the exposition seems wide enough to embrace almost everything that concerns our daily life.

DR. NYE: Mr. J—aet 38. Fracture of tibia and fibula with astragalus forced up between the fractured ends. Fracture caused by alighting heavily and suddenly on right heel, producing fracture of both bones about 1½ inches above the ankle joint. The fracture was set by Dr. Nye, assisted by Dr. Anderson. To be satisfied that everything was correct, an x-ray picture of the limb was taken. The x-ray apparatus belonging to the Denver Homeopathic Medical College was used and excellent results were obtained. By the way, our facilities for x-ray work are the best in the State, or in the entire west.—*Clinic, Denver, Homeopathic Hospital.*

SIGNALING WITHOUT CONNECTING WIRES. LODGE. *Lond. Elec. Rev.* and *Elec.*, Jan. 28. *Elect. World.*—An abstract of a recent Physical Society paper, the former journal containing a diagram of one of the arrangements described. He prefers the above term to "wireless telegraphy." The first thing necessary is to have a persistent vibration which can be tuned to, and not one that dies off rapidly and irregularly; this excludes the Righi transmitter; capacity is necessary, and the period can be altered by varying either the capacity or the self-induction, both of which he uses in his system, tuning with the latter; the receiver is a real resonator, and not a mere collector; the most novel feature is a coil of copper introduced between the two triangular wings; the waves used are over 30 yards long, thus shortening the shadows of an obstacle of moderate size, as the Hertz waves would bend around it like a sound wave; the length of Marconi's waves is about 4 feet; the coherer may be reduced with advantage to a single contact, for instance, a needle pressed against a flat spring, which is the most sensitive of all coherers, and requires no mechanical tapping; under certain conditions it is too sensitive. It is editorially suggested that the coherer may be rendered sensitive to light. The instrument illustrated diagrammatically is capable of being used both as a transmitter or receiver.

Polk's Medical and Surgical Register of the United States and Canada is now undergoing its fifth revision. Physicians who have not given their names to the canvassers are urged to report to headquarters at once, giving full information. Address, R. L. Polk & Co., Detroit, Mich.

NEURECTOMY FOR TIC-DOULOUREUX.

Bernays' "Report of a Surgical Clinic," complimentary to the members of the Mississippi Valley Medical Association, contains the following, in reference to his patient's condition and treatment before neurectomy for tic-douloureux was decided upon :

"Case V.—The patient, aet. 50, white, female. Family history : Has one sister who suffered from emotional insanity ; otherwise the family history is good. Previous health excellent. The present trouble began with a severe neuralgic toothache, localized in the right lower molars. Paroxysms of pain were of daily occurrence, and most severe in the mornings about breakfast time. The pain subsided temporarily whenever the teeth were pressed firmly together or upon any substance held between them, but only to return when the pressure was withdrawn. The presence of anything cold in the mouth immediately produced the most exquisite pain ; moderate heat produced a soothing effect. After two months, the pain became continuous, and four molars were extracted without in any way relieving it. On the contrary, the pain increased in severity until October when it ceased entirely for a period of two weeks, and then returned as severely as before. Another tooth was sacrificed, but without relief ; the pain became continuous until last June when it again subsided for a period of six weeks. A recurrence then took place together with an involvement of the parts supplied with the second branch of the fifth nerve. Pain has been constant until the operation. She had strenuously avoided the use of narcotics, but during the more active periods of pain, anti-kamnia in ten grain doses was found to be an efficacious obtunder." After describing the neurectomy, Pof. Bernays says : "Eight weeks have now elapsed since the operation, and no recurrence of the trouble has taken place."

ORTHOGRAPHY.

We have been so many times embarrassed with so-called "typographical errors" which have heretofore crept into the JOURNAL that the feeling has ripened into this opinion: While it is of no particular credit to any one to spell correctly it is a disgrace to spell incorrectly.

Typographical errors in spelling must hereafter cease.

Including this issue of the JOURNAL *and all subsequent issues until the June number we will give one year's subscription free to each of the first two persons calling our attention to any misspelled word or words either in the reading matter or advertisements—excluding proper names.*

SOURCE OF X-RAYS. TROWBRIDGE AND BOURBANK. *Am. Jour. of Sc.*, Feb.—An article describing experiments with Crooke's tubes through which continuous wires are passed and in which there is no discharge in the usual sense ; it was discovered that x-rays were given off from every element of this conductor at right angles to its circuit when a disruptive discharge occurred in the circuit ; this was obtained by means of the very high E. M. F. obtained from a Plante rheostatic machine and 10,000 storage batteries. Their conclusions are that such a tube is well suited for studying electric lines of induction ; that the direction of the so-called x-rays and cathode rays can be changed by electric induction ; that the so-called x-ray burn can be produced by an intense state of electrification ; that the so-called cathode and x-rays are given off from every element of a continuous conductor at a high stage of the vacuum, both when it is the cathode or the anode of the electrical circuit. They suggest the term electric

rays or rays of polarization as preferable to cathode and x-rays.

X-RAY IN MEDICAL WORK.—The statement that at a Liverpool hospital x-rays were utilized in no less than 57 cases during the year 1897, is followed up by the treasurer of the St. Thomas's Hospital, Albert Embankment, who says, in a letter to the *Times*, that at St. Thomas's as many as 416 patients passed through the x-rays department during the year. So great is the work, that an assistant to the officer in charge is about to be appointed.—*Electrical Review*, London.

A RYTHMIC DILATION OF THE HEART DISCOVERED BY THE ROENTGEN RAYS.—A special dispatch from Paris of February 12 says that Prof. Bouchard has discovered a new movement of the heart by means of the Roentgen rays. It is a rythmic dilation during respiration and is not connected with the ordinary movements of the heart. It appears to arise from a diminution of pressure in the interior of the thoracic cage during inspiration.—*Electrical Eng.* N. Y.

A PERFECT CO-ADJUVANT.—Physicians should not forget that no matter what their preference may be as to the form in which milk should be used for their patients and the babies under their care, whether it is Modified, Sterilized, Pasteurized, Peptonized, treated by some other method, or natural, they can always depend on the perfect co-adjuvancy of that unrivaled dietetic preparation Imperial Granum. Many years of successful clinical experience having proved this combination of nutriments to be acceptable to the palate and also to the most delicate stomachs at all periods of life, being in many cases retained and assimilated when everything else is rejected, though in very extreme cases the Imperial Granum is often prepared with pure water only.

GAROFEN.

Condensed From an Article in the *Medical Summary* by Dr. Ben. Brodnax, Brodnax, La.
Name of Product Changed From Gurania to Garofen.

After trying a preparation called Garofen I thought some of my brethren would like to know of a pleasant pain reliever. Some time ago I received a sample of the remedy from the Phenique Chemical Co., of St. Louis, Mo., but as I had a supply of other material, and not many cases requiring the effects, I put off testing it until I had a case of sick headache. I watched the effects of one tablet every half hour, with the results that the second tablet gave relief, and after the third the patient slept well. There was no diaphoretic effect from it, and no after effects that were unpleasant. The lady woke up as from a natural sleep. In a case of uterine pain from suppressed menstruation the effects were immediate; and after five tablets—one every half hour—there was perfect ease. I had used Macrotis (B. Keith & Co.'s Concentrated Tincture), for a day or two, and continued the same for several days after the flow commenced. I have also used Garofen in several cases of measles in people over forty years old, with the effect of quiet sleep and much comfort to the patients. I can not but think that it is the hypnotic which will take the place of morphine, acetanilid and its many compounds and mixtures. It answers a splendid purpose where you desire to allay pain without any sweat, or any of the effects of heart action with which the coal tar preparations are charged. As a quieter of pain, pure and simple, I have found nothing superior to it outside of a hypodermic of morphine. I dread the use of morphine among my clientel, and have for several years tried everything that would in any way supplant it. This preparation, I believe, comes as near to it as any that I have used.

X-RAY APPARATUS FOR SALE.

The owner is offering this apparatus for sale because he is in other business.

The machine is practically new, having been used but a few days and is offered at a very low price. Good work is done with it and with a proper rheostat it can be used for electro-therapeutic purposes.

With the coils there are in addition two rubber pans 14x16 inches for developing purposes, the condenser is mounted in the coil base, one fluoroscope, one stand and eight storage batteries. The speed regulator and breaker are conveniently combined with the switch.

The coil is thoroughly insulated with black hard rubber and mounted on polished cherry—the base being but 16x30 inches.

It gives a strong eight inch spark and generates abundant x-radiance. One half of the strength of the eight storage batteries will discharge a spark six inches. The eight cells afford abundant current for all purposes. The coil is a most powerful one and can be used for the demonstration of many mechanical devices in addition to x-ray therapeutic work. The cells are large and can be used singly or in combination.

Letters of inquiry will be promptly answered by addressing "K"

X-RAY PUBLISHING CO.,
St. Louis, Mo.

GAROFEN.—Cut this out and mail to the Phenique Chemical Co., of St. Louis, Mo., and you will receive free of charge, sample, literature and reports on the New Vegetable Analgesic and Anti-pyretic that has come to take the place of Morphine Acetanilid and its many compounds. Garofen contains no coal tar products, nor opium or its alkaloids in any form.

Climate Cure

OF

NEW MEXICO

AND

ARIZONA.

The SALT RIVER VALLEY of Arizona and the various Health Resorts in NEW MEXICO.

are unrivaled for the relief of chronic lung and throat diseases. Pure, dry air; an equable temperature; the proper altitude; constant sunshine.

Descriptive pamphlets issued by Santa Fe Route Passenger Department contain complete information relative to those regions.

The items of altitude, temperature, humidity, hot springs, sanatoriums, cost of living, medical attendance, social advantages, etc., are concisely treated from an impartial standpoint.

Physicians are respectfully asked to place this literature in the hands of invalids who need a change of climate. Address

J. W. TEDFORD, Gen. Agt.,
108 North Fourth Street, ST. LOUIS, MO.

Eureka Springs, Ark.,

As a summer and winter resort cannot be surpassed. To this famous all-year-round resort round-trip tickets are on sale from all principal cities throughout the country at greatly reduced rates.

Double daily trains from St. Louis. A neat little pamphlet giving detailed description of Eureka Springs will be mailed free upon application to GEO. T. NICHOLSON, Gen'l Pass. Ag't., Frisco Line, St. Louis, Mo.

For $100, Worth $200.

High Frequency X-Ray Apparatus

FOR SALE.

All Accessories with Machine, Fluoroscope, 2 Tubes and Stand.

Address "M," this Journal.